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ABSTRACT

Richards, Gaver, and Golicz (1984) found that, in contrast to peers whose grades were accurately predicted from performance on aptitude tests, both extremely underachieving and extremely overachieving fourth-graders had negative academic attitudes. The present study aimed to replicate and extend these findings. Subjects in the replication study were predominantly from lower-class, rural homes, differing from the suburban, middle-class sample of the original study. In the replication, 30 fourth-grade, 71 fifth-grade, and 80 sixth-grade students were administered the Elementary Form of the Estes Attitude Scales and the Science Research Associates battery. Also, end of year mathematics, reading, and science grades were obtained. Results of regression analyses and one-way analyses of variance did not replicate the findings of Richards and colleagues, as far as overachievers were concerned: at every grade level extreme underachievers displayed the most negative attitudes and extreme overacheivers displayed the most positive. The discrepancy between findings of the original and those of the replication study is speculatively attributed to demographic differences in the samples. (RH)

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Attitudes Toward School Subjects of Academically Unpredictable Elementary School Children

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Attitudes Toward School Subjects of Academically Unpredictable Elementary School Children

It is traditional to think of affective variables, such as attitudes toward school subjects, as important because of the influence they exert on school achievement (Whitmore, 1980). But the cultivation of positive attitudes might well be a goal as worthy for the educational process as the development of academic competence (Richards & Clark, 1983). Thus, how children feel about the subjects they study should be an important dependent variable for educational researchers in its own right. We have come to believe that whenever school work fails to challenge a child's capability or capture a child's interest, the likely outcome is low achievement coupled with negative views about what is being being taught. Among the sequelae of underachievement, then, should be a lack of interest or an apathetic attitude toward school subjects (Golicz, 1982). More specifically, children who underachieve should harbor negative attitudes toward reading, math, and science--the subject areas in which their underachievement is usually manifest.

In a recently published paper, Richards, Gaver & Golicz (1984) presented evidence that underachieving fourth-graders--those who earn lower grades than predicted from their performance on aptitude tests--do indeed manifest negative academic attitudes. But contrary to initial speculations made by these authors, extreme overachievers, as well as underachievers, evidenced poorer attitudes than their more accurately predicted

counterparts. Richards et al. argued that such results are consistent with the views of Elkind (1981). From this perspective, overachievers are thought to be hurried children who are pressured by their parents and teachers to perform academic tasks that are inappropriate for their level of cognitive maturity. One consequence of such pressure might be a dislike for school subjects. Hence, the observed effect.

Although we find such results intriguing and deserving of more than a speculative explanation, we also know that it is important to investigate whether such a phenomenon can be replicated with children of other grade levels and backgrounds. The primary purpose of the present study is to replicate and extend the Richards et al. research. To do so, we have chosen a sample very different from the suburban, middle-class one of the original research.

The subjects were 181 children, approximately equal numbers of boys and girls, who attended two elementary schools in a rural county of western Virginia during the spring of 1984. Although all socioeconomic levels were represented, these children were predominantly from lower class homes. All were white. The sample consisted of three cohorts: 30 fourth-graders, 71 fifth-graders, and 80 sixth-graders.

We measured attitudes toward school subjects with the Elementary Form of the Estes Attitude Scales (Estes, Estes, Richards, & Roettger, 1981). This instrument is given orally, and consists of 42 three-choice Likert items which are arranged into three factor-analytically distinct subscales: Mathematics,

reading, and science. Normative information and evidence for the reliability and validity of these scales can be found in the testing manual and Richards and Clark (1983). The scales were administered by central office personnel according to standard instructions. Teachers did not remain in the classrooms while the children were tested.

Each child was also administered the SRA battery as part of the routine standardized assessment conducted each spring by the school district. From these data, SRA Educational Ability Series (EAS) Quotients were obtained. Although EAS quotients are standardized according to grade level rather than age, they are reported in IQ units. End of the year math, reading, and science grades were also obtained. Teachers scaled these grades in percentage units, and they represent the overall average of each child's academic performance over the entire 1984 school year.

Grades in the three subject areas proved to be highly intercorrelated within all three cohorts (correlations ranged from .84 to .91 for fourth-graders; .67 to .75 for fifth-graders; and .64 to .78 for sixth-graders). These results, together with related descriptive data, are presented in Tables 1 and 2. Because of the high intercorrelations among the various subject areas, grade-point-averages (GPAs) were used as the sole index of achievement in subsequent analyses. The analyses were conducted in the following order:

First, to identify children who were achieving above or below what was predicted from their EAS performance, we conducted

three regression analyses--one for each cohort. GPAs were regressed on EAS quotients (in IQ units), and the constants of regression determined. (The resulting constants, B and C respectively, were as follows: .1785 and 71.06 for fourth-graders; .3016 and 53.61 for fifth-graders; .2713 and 55.49 for sixth-graders.) We then computed predicted GPAs for each student on the basis of these parameters. Discrepancies between predicted and actual GPAs indexed over- or underachievement.

Next, we rank ordered the students within each cohort according to discrepancy score. The top 1/6 and bottom 1/6 were classified as extreme overachievers (EO) and underachievers (EU) respectively. The 1/3 who were slightly above or below predicted performance were classified as moderate overachievers (MO) and underachievers (MU) respectively. (Because of natural groupings, these ratios were only approximate for fifth- and sixth-graders.)

Finally, for each cohort, we conducted a series of one-way analyses of variance, one with each of the Estes attitude scales as a dependent measure (viz., math, reading, science, and general attitude). Linear and quadratic trends were tested for significance. We then massed the data across cohorts and conducted an identical analysis on the total sample.

Means and standard deviations of attitude scores as a function of achievement group and cohort are shown in Table 3, similar statistics for the massed data in Table 4, and the results of the trend analyses in Tables 5, 6, 7, and 8. As can be seen in the tables, the results did not replicate the findings of Richards et al. (1984)--at least as far as overachievers were

concerned. None of the quadratic trends that were so evident in the previous research emerged. On the contrary, there were significant linear trends at every grade level--extreme underachievers (EU) displayed the most negative attitudes; extreme overachievers (EO), the most positive.

We believe that our failure to replicate may have been due to fundamental differences in the demographic makeup of the two samples studied. Subjects in the initial research were from upwardly mobile, middle-class suburban families. In contrast, those of he present study were from more relaxed, predominantly lower-class rural families. It is likely that the identified overachievers of the current study were more self-motivated since there was little external incentive to excel in their studies. In contrast to their suburban counterparts, they overachieved because they were intrinsically interested in the subjects they studied--not because they felt pressured to succeed. Such an explanation for these conflicting results is, of course, speculative (as reviewers of this paper pointed out). But we are currently conducting research on a third sample of elementary school children that should help resolve the enigma posed by overachieving students. We would like to discuss our current line of inquiry with our roundtable participants.

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Table 1

Means and Standard Deviations of EAS Quotients, Grades in Reading, Math, and Science, and Grade Point Averages (GPAs) as a Function of Cohort

Cohort	EAS	Reading	Math	Science	GPA
Fourth Graders	96.87	88.33	88.30	88.40	88.34
(n = 30)	(16.41)	(6.36)	(7.16)	(6.43)	(6.37)
Fifth Graders	110.92	87.47	86.47	87.22	87.06
(n = 72)	(13.46)	(6.64)	(7.12)	(7.66)	(6.46)
Sixth Graders	109.58	85.20	86.16	84.29	85.22
(n = 80)	(13.65)	(6.05)	(6.89)	(8.53)	(6.48)

Note. Standard deviations in parentheses.

Table 2

Intercorrelations Among EAS Quotients, Grades, and Grade Point Averages (GPAs) as a Function of Cohort

Cohort	EAS	Reading	Math	Science
Fourth Graders (n = 30)				
Reading	.50			
Math	.44	.84		
Science	.39	.89	.91	
GPA	.46	.95	.96	.97
Fifth Graders (n = 72)				
Reading	.59			
Math	.58	.75		
Science	.54	.75	.67	
GPA	.63	.92	.89	.90
Sixth Graders (n = 80)				
Reading	.62			
Math	.49	.64		
Science	.47	.78	.74	
GPA	.57	.88	.88	.94

Note. All correlations significant at the .05 level.

Table 3

Means and Standard Deviations of Attitude Scores as a Function of Achievement Group and Cohort

	EU	MU	MO	EO
Fourth Graders	(n = 5)	(n= 10)	(n= 10)	(n = 5)
Reading Attitude	16.00 (9.82)	20.50 (8.98)	21.00 (10.15)	25.60 (2.51)
Math Attitude	10.80 (2.17)	17.20 (7.61)	21.40 (6.40)	24.20 (2.28)
Science Attitude	19.20 (9.63)	21.40 (7.24)	21.60 (9.22)	25.20 (1.92)
General Attitude	46.00 (20.44)	59.10 (21.08)	64.00 (24.95)	75.00 (4.58)
Fifth Graders	(n= 13)	(n= 23)	(n= 22)	(n= 12)
Reading Attitude	18.08 (9.33)	17.83 (9.15)	21.64 (9.06)	24.38 (6.32)
Math Attitude	11.69 (5.33)	17.65 (7.96)	19.68 (6.82)	23.62 (3.64)
Science Attitude	19.00 (7.36)	19.57 (7.01)	23.77 (5.09)	24.17 (3.49)
General Attitude	48.77 (16.24)	55.04 (20.95)	65.09 (17.84)	73.33 (11.86)
Sixth Graders	(n= 13)	(n= 27)	(n= 27)	(n= 13)
Reading Attitude	14.00 (9.95)	19.11 (7.98)	22.81 (6.16)	22.54 (7.75)
Math Attitude	12.31 (8.20)	17.26 (6.24)	19.74 (6.150	23.08 (4.41)
Science Attitude	14.08 (7.50)	18.44 (8.39)	20.56 (6.64)	23.85 (3.74)
General Attitude	40.38 (23.42)	54.81 (17.00)	63.11 (14.74)	69.46 (12.97)

Table 4

Means and Standard Deviations of Attitude Scores as a Function of Achievement Group (All Subjects)

Attitude Scale	EU (n = 31)	MU (n = 60)	MO (n = 59)	EO (n = 31)
Reading Attitude	16.03 (9.53)	18.85 (8.51)	22.07 (7.96)	23.61 (6.50)
Math Attitude	11.81 (6.26)	17.40 (7.05)	20.00 (6.37)	23.48 (3.73)
Science Attitude	16.97 (7.92)	19.37 (7.64)	21.93 (6.67)	24.20 (3.34)
General Attitude	44.61 (19.91)	55.62 (19.01)	64.00 (17.61)	71.93 (11.45)

Table 5

Trend Analysis Summary for Fourth Graders

Source	df	Mean Squares	F-ratio
Reading			
Linear Term	1	201.83	2.54
Quadratic Term	1	.07	
Within Groups	26	79.45	
Mathematics			
Linear Term	1	536.81	15.01***
Quadratic Term	1	21.60	.60
Within Groups	26	35.75	
Science			
Linear Term	1	76.94	1.23
Quadratic Term	1	3.27	.05
Within Groups	26	62.40	
General			
Linear Term	1	2129.60	4.88*
Quadratic Term	1	7.35	
Within Groups	26	436.88	

*p < .05

**p < .01

***p < .001

Table 6

Trend Analysis Summary for Fifth Graders

Source	df	Mean Squares	F-ratio
Reading			
Linear Term	1	395.69	5.21*
Quadratic Term	1	37.84	.50
Within Groups	67	75.98	
Mathematics			
Linear Term	1	933.34	21.76***
Quadratic Term	1	17.53	.41
Within Groups	67	42.89	
Science			
Linear Term	1	308.07	8.45**
Quadratic Term	1	.02	
Within Groups	67	36.47	
General			
Linear Term	1	4857.09	15.23***
Quadratic Term	1	16.71	.05
Within Groups	67	318.97	

*p < .05

**p < .01

***p < .001

Table 7

Trend Analysis Summary for Sixth Graders

Source	df	Mean Squares	F-ratio
Reading			
Linear Term	1	651.00	10.86**
Quadratic Term	1	127.35	2.13
Within Groups	76	59.92	
Mathematics			
Linear Term	1	823.50	20.61***
Quadratic Term	1	11.45	.29
Within Groups	76	39.95	
Science			
Linear Term	1	666.13	13.26***
Quadratic Term	1	5.09	.10
Within Groups	76	50.24	
General			
Linear Term	1	6403.35	22.36***
Quadratic Term	1	286.43	1.00
Within Groups	76	286.41	

*p < .05

**p < .01

***p < .001

Table 8

Trend Analysis Summary for All Subjects

Source	df	Mean Squares	F-ratio
Reading			
Linear Term	1	1234.69	18.30***
Quadratic Term	1	11.77	.17
Within Groups	177	67.48	
Mathematics			
Linear Term	1	2272.43	58.47***
Quadratic Term	1	45.74	1.18
Within Groups	177	38.86	
Science			
Linear Term	1	993.02	21.23***
Quadratic Term	1	.17	
Within Groups	177	46.78	
General			
Linear Term	1	13321.57	42.64***
Quadratic Term	1	84.03	.27
Within Groups	177	312.43	

*p < .05

**p < .01

***p < .001